

REMARKS

Claims 1-12 are pending. Claims 1 and 2 have been amended; the specification has been amended; and drawings have been added (Figs. 6 and 7).

The drawings are objected to for allegedly failing to show every feature of the claims. by this Amendment, new Figures 6 and 7 are added. In addition, the specification is amended to describe these new figures. Based on these amendments, the objection should be withdrawn.

Claims 2-3 and 9-10 have been objected to by the Examiner. Claim 2 has been amended to overcome the objections and to further clarify what Applicant believes to be patentable subject matter. Reconsideration and withdrawal of the objection is hereby solicited.

Claims 1, 4, 6-8, and 11-12 are rejected under 35 U.S.C. §103(a) over Hoshino in view of Kortright et al. Claim 5 is rejected under 35 U.S.C. §103(a) over Hoshino in view of Kortright as applied to claim 1 and further in view of Montcalm et al. Applicant respectfully traverses the rejections.

Hoshino is directed to a method of fabricating a reflective mask, and methods and an apparatus for detecting wet etching end points and inspecting side etching amounts (See paragraph [0002]). Hoshino describes a reflective mask for EUV lithography comprising a multilayer structure formed by alternating superposed first metal layers (Mo) and second layers made of amorphous silicon (a-Si) (see paragraphs [0011] and [0012]).

As acknowledged by the Examiner in the Office Action, Hoshino does not teach or suggest a second layer comprised of the amorphous silicon compounds recited in claim 1.

Kortright does not overcome the deficiencies of Hoshino. Kortright teaches that amorphous silicon carbide is known to have a high reflectance in the extreme ultraviolet spectral region (See Abstract and page 2841, column 1, lines 1-3). However, like Hoshino,

Kortright does not teach or suggest an amorphous silicon carbide comprised of the amorphous silicon compounds recited in claim 1.

Specifically, Kortright does not teach or suggest a carbon content comprised between 0.01 and 0.3. On the contrary, Kortright teaches that the sputtered a-Si-C has a composition very close to stoichiometric SiC but slightly C-rich (page 2842, column 1, 2nd paragraph of B). Thus, Kortright does not and cannot suggest the use of an amorphous silicon carbide (a-Si-C), with a carbon content comprised between 0.01 and 0.3.

Furthermore, the claimed x value comprised between 0.01 and 0.3 permits stabilization of the mechanical stresses with respect to temperature variation while simultaneously preserving maximum optical reflection. If x is higher than 0.3, the compound chosen from a-Si-H_x; a-Si-CH_x; a-Si-C_x; a-Si-OH_x; a-Si-F_x; a-Si-FH_x; a-Si-N_x; a-Si-NH_x can become absorbent and the optical function of the reflector can be damaged. If x is lower than 0.01, the mechanical stresses of the reflector can fluctuate. (See page 3, lines 9-11 of the specification; See figures 1-5). Kortright clearly does not teach or suggest the importance of the claimed range of x. The only suggestion of this range comes from the present specification. Thus, any allegation that this range would have been obvious is clearly based on impermissible hindsight reasoning.

Regarding claim 5, Montcalm does not overcome the deficiencies of Hoshino in view of Kortright. Specifically, Montcalm does not teach the amorphous silicon compound recited in claim 1.

Hoshino does not teach or suggest all of the features of claim 1. In addition, neither Kortright nor Montcalm overcome the deficiencies of Hoshino. Therefore, the rejections over Hoshino in view of Kortright and/or Montcalm should be reconsidered and withdrawn.

Claims 1, 4, 6-8, and 11-12 are rejected under 35 U.S.C. §103(a) over Burger et al. in view of Hoshino. Claim 5 is rejected under 35 U.S.C. §103(a) over Burger in view of

Hoshino as applied to claim 1 and further in view of Montcalm. Applicant respectfully traverses the rejections.

Burger is directed to a multilayer structure comprised of an alternating first metal or metal carbide layer and a second layer of amorphous silicon containing hydrogen (Column 11, lines 41-64; Column 13, lines 50-67; and Column 14, lines 1-10).

Burger does not teach or suggest that the a-Si-H layer has reflective properties in the EUV range or optical properties for the multilayer structure. Additionally, Burger does not disclose any value for the hydrogen content.

There is no motivation to combine Burger with Hoshino. As stated previously, Burger does not teach that the a-Si-H layer has reflective properties in the EUV range or optical properties for the multilayer structure. Hoshino, however, teaches a reflective mask for EUV lithography comprising a multilayer structure formed by alternating superposed first metal layers (Mo) and second layers made of amorphous silicon (a-Si). Since Burger does not teach reflective properties in the EUV range or optical properties, there is no suggestion of the desirability of combining Burger with Hoshino.

In addition, Hoshino does not overcome the deficiencies of Burger. As stated above, Hoshino teaches a reflective mask for EUV lithography comprising a multilayer structure formed by alternating superposed first metal layers (Mo) and second layers made of amorphous silicon (a-Si) (see paragraphs [0011] and [0012]). However, like Burger, Hoshino does not teach or suggest an amorphous silicon comprised of the amorphous silicon compounds recited in claim 1. Specifically, Hoshino does not teach a hydrogen content comprised between 0.01 and 0.3.

Regarding claim 5, Montcalm does not overcome the deficiencies of Burger in view of Hoshino. Specifically, it does not teach the amorphous silicon compositions of claim 1.

Burger does not teach or suggest all of the features of claim 1. In addition, neither Hoshino nor Montcalm overcome the deficiencies of Burger. Furthermore, there is no motivation to combine Burger and Hoshino. Therefore, the rejections over Burger in view of Hoshino and/or Montcalm should be reconsidered and withdrawn.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-12 is earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachment:

Drawing Sheet (Figs. 6 and 7)

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DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461
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Amendments to the Drawings:

The attached new drawing sheet adds Figures 6 and 7.

Attachment:

New Sheet